

International Conference

## **Shock Waves in Condensed Matter**

St. Petersburg, Russia, September 2-6, 1996.

### **Response of PETN to Low Pressure Dynamic Loading \***

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#### **Abstract**

Initiation of pentaerythritol tetranitrate (PETN) by low pressure dynamic loading has been revisited. Experiments were performed in our 4 inch (101 mm) propellant driven gas gun with imbedded manganin pressure gauges as the primary diagnostic technique. PETN samples were pressed to a density of 1.68 g/cc which is 94% TMD.

In earlier studies<sup>(1)</sup> it was found that PETN had some peculiarities during the low pressure initiation process. That same strange behavior was found in our current study. Initial shock wave was steady and pressure records are flat showing no indication of reaction to take place. Reaction front seems to start at a later time at the impact surface rather than at the shock front like in most of the heterogeneous explosives. In addition, before the reaction front, there is an evidence of a new time dependent pressure release wave that takes place and originates at the impact surface. Various explanations to this abnormal behavior are presented and discussed leaving the identification of the real phenomenon for future studies.

(1) - Jerry Wackerle, J.O. Johnson, and P.M. Halleck, "Shock Initiation of High Density PETN", Proceedings of the Sixth Symposium (International) on Detonation, pp. 20-28, Naval Surface Weapons Center, White Oak, August 24-27, 1976.

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\* Work performed under the auspices of the U.S. Department of Energy by the Lawrence Livermore National Laboratory under contract W-7405-Eng-48